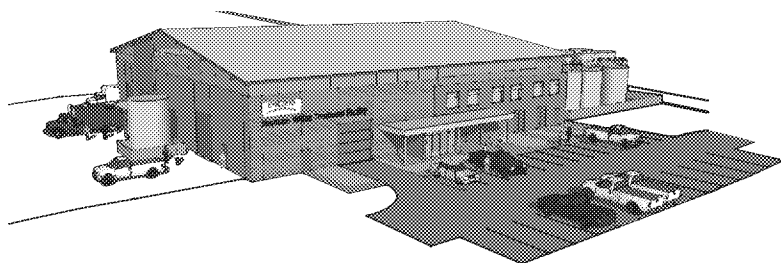


# Neptune Water Treatment Facility



## Oil, natural gas and water

While energy in central Wyoming has been developed for many years, there has always been the challenge of how to manage the water that is produced along with natural gas and other hydrocarbons. In 2011, Encana began the Environmental Impact Statement (EIS) process for the Moneta Divide Natural Gas and Oil Development Project. At that time, Encana recognized that in order for the Project to be a success, our water management strategy had to not only be cost effective, but also technologically more advanced than anything that had been done before. It was with these two goals in mind that Encana approached like-minded companies such as General Electric, Dow Water & Process Solutions and many others to make the Neptune Water Treatment Facility a reality.

## How it works

Produced water will enter the Neptune Water Treatment Facility through the field pipeline gathering network. The water will travel through a series of filters and systems that will "pretreat" the water before going into a reverse osmosis (RO) membrane. The "pretreat" steps are designed to remove contaminants that could potentially plug up the RO membranes. This also includes capturing residual amounts of hydrocarbons and sending that hydrocarbon portion to sales. This water treatment system will effectively clean and meet the water requirements of Class 1 standards (considered the same purity as mountain spring water). The field produces more water than what is used for operations and a viable water handling system is needed to meet the demand. Water used for completion operations can be treated on the individual well site to remove bulk solids and hydrocarbons with the excess going to the pipeline network and eventually into the water treatment facility.

**3rd** WATER TREATMENT  
**LARGEST** FACILITY  
— OF ITS KIND —  
IN THE WORLD

WORKING TO BECOME  
A  
**LEED CERTIFIED**  
**BUILDING IN 2014**

**20,000** CAN TREAT  
**SQUARE FOOT** UP TO  
**BUILDING** **1 MILLION**  
**GALLONS**

OR  
**HALF** OF  
**THE SIZE** PRODUCED  
OF A **WATER**  
**FOOTBALL FIELD** **A DAY**

**750** GALLONS  
PER MINUTE

### NEPTUNE WATER TREATMENT FACILITY

**90%**  
RECOVERY

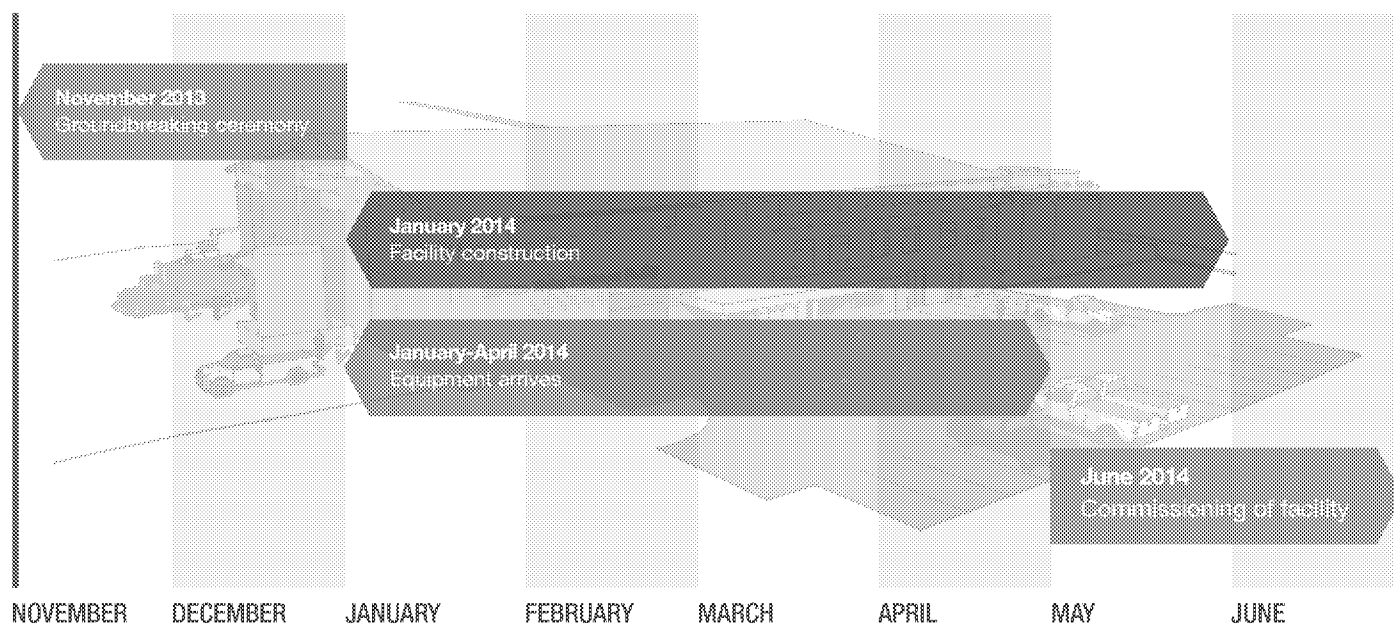
900,000 GALLONS  
(22,500 BPD) OF  
CLEAN WATER A DAY  
OR MORE THAN ONE  
OLYMPIC SIZE  
SWIMMING POOL

**10%**  
WASTEWATER

100,000 GALLONS  
(2,500 BPD)  
CONCENTRATED BRINE

**encana**

## Construction timeline



### Where the water comes from

Produced water will come from wells within the Moneta Divide area and is highly variable depending on well productivity. It's estimated that on average, each well will produce approximately 3,000 bbls per day of produced water initially and decline throughout its life. At peak production it is anticipated that as much as 1 million bbls per day of produced water could be produced from the Moneta Divide Field once the EIS is approved.

This water treatment system is designed to take produced water from the field and clean it up to meet the water quality of the receiving waters (combination of aquatic life and drinking water specifications).

### Where the water goes

Once the water is cleaned and meets the discharge requirements, some will be used for operations in the field and the rest will be discharged via pipeline into the Boysen reservoir as proposed in the Moneta Divide EIS Plan of Development. The water will adhere to strict State of Wyoming requirements to ensure water quality, and tests will be conducted frequently at the facility as well as the discharge point.

### Partners

**GE** is the main technology provider, reducing TDS in produced water from 7,500 ppm to less than 250 ppm (drinking water quality)

**Dow** through steam regeneration of their Optipore resin, allows hydrocarbons in the water to be captured and sold

**GWD** is an engineering firm developing detailed process design

**RETTEW** is an engineering firm developing detailed facility design

### Moneta Divide Natural Gas and Oil Development Project

- Working through the EIS Process on plan of development
- Potential to develop 4,100 wells over 30 years
- Approximately 265,000 acres in Fremont and Natrona Counties
- Expected to provide hundreds of permanent jobs in local communities
- Potential to provide billions of dollars in tax revenues to state and local governments

#### ABBREVIATIONS:

**BPD:** barrels per day  
**bbls:** barrels  
**ppm:** parts per million  
**TDS:** total dissolved solids